



**UNITED STATES DEPARTMENT OF COMMERCE  
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/737,042	10/30/96	HEED	B C-35620

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QM61/0708

EXAMINER

LEO, L

ART UNIT

PAPER NUMBER

3743

DATE MAILED: 07/08/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

The amendment filed on April 23, 1999 amending the claim, which originally read on Figure 1, to read on Figure 4 is non-responsive (MPEP § 821.03).

Since the above-mentioned amendment appears to be a *bona fide* attempt to reply, applicant is given a TIME PERIOD of ONE (1) MONTH or THIRTY (30) DAYS, whichever is longer, from the mailing date of this notice within which to supply the omission or correction in order to avoid abandonment. EXTENSIONS OF THIS TIME PERIOD UNDER 37 CFR 1.136(a) ARE AVAILABLE.

Any inquiry concerning this communication should be directed to Leonard R. Leo whose telephone number is (703) 308-2611.

LEONARD R. LEO  
PRIMARY EXAMINER  
ART UNIT 3743

June 28, 1999

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The request filed on September 18, 1998 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 08/737,042 is acceptable and a CPA has been established. An action on the CPA follows. Claim 6 has been canceled, claim 5 is pending.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hultgren in view of Usher, further modified by Seidel.

Hultgren discloses all the claimed limitations except the ridges and channels forming at least a 45 degree angle with respect to the length of the plate nor inlet and outlet ports disposed at a 45 degree angle with respect to the corners.

Usher discloses a heat exchanger for 2 fluids comprising a plurality of rectangular plates (Figures 3 and 4); wherein the angle of the ridges and channels are 30 degrees with respect to the width of the plate (i.e. 60 degrees with respect to the length of the plate) for the purpose of improving heat exchange (page 3, lines 31-49).

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Seidel discloses a heat exchanger for 2 fluids comprising a plurality of rectangular plates 12; and inlet and outlet ports 20, 20' and 22, 22' (Figure 12) arranged at 45 degree angles with respect to the corners for the purpose of achieving a desired flow characteristic.

Since Hultgren and Usher are both from the same field of endeavor, the purpose disclosed by Usher would have been recognized in the pertinent art of Hultgren.

Since Hultgren and Seidel are both from the same field of endeavor, the purpose disclosed by Seidel would have been recognized in the pertinent art of Hultgren.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Hultgren ridges and channels having an angle of 60 degrees with respect to the length of the plate for the purpose of improving heat exchange as recognized by Usher, and employ in Hultgren inlet and outlet ports arranged at 45 degree angles with respect to the corners for the purpose of achieving a desired flow characteristic.

The rejection in view of Herrmann has been withdrawn.

Regarding applicant's remarks with respect to the claims as amended, Hultgren discloses fold lines 27, and the angle between the corrugations of adjacent plates may be 90 degrees (column 3, lines 24-30). The secondary reference of Usher discloses the angle of the corrugations may be changed to achieve desired heat exchange characteristics. It is well known in the art that pressure drop and heat exchange are directly related. A high pressure drop provides more heat exchange, while a low pressure drop provides less heat exchange. One of ordinary skill in the art must decide whether the increased power requirements warrant

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the increase in heat exchange. The device of the combination of references as a whole is similar in structure to the claimed instant invention and is believed to function in a similar manner.

No further comments are deemed necessary at this time.

Any inquiry concerning this communication should be directed to Leonard R. Leo whose telephone number is (703) 308-2611.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 3700 receptionist whose telephone number is (703) 308-0861.



LEONARD R. LEO  
PRIMARY EXAMINER  
ART UNIT 3743

October 9, 1998